FIG.1

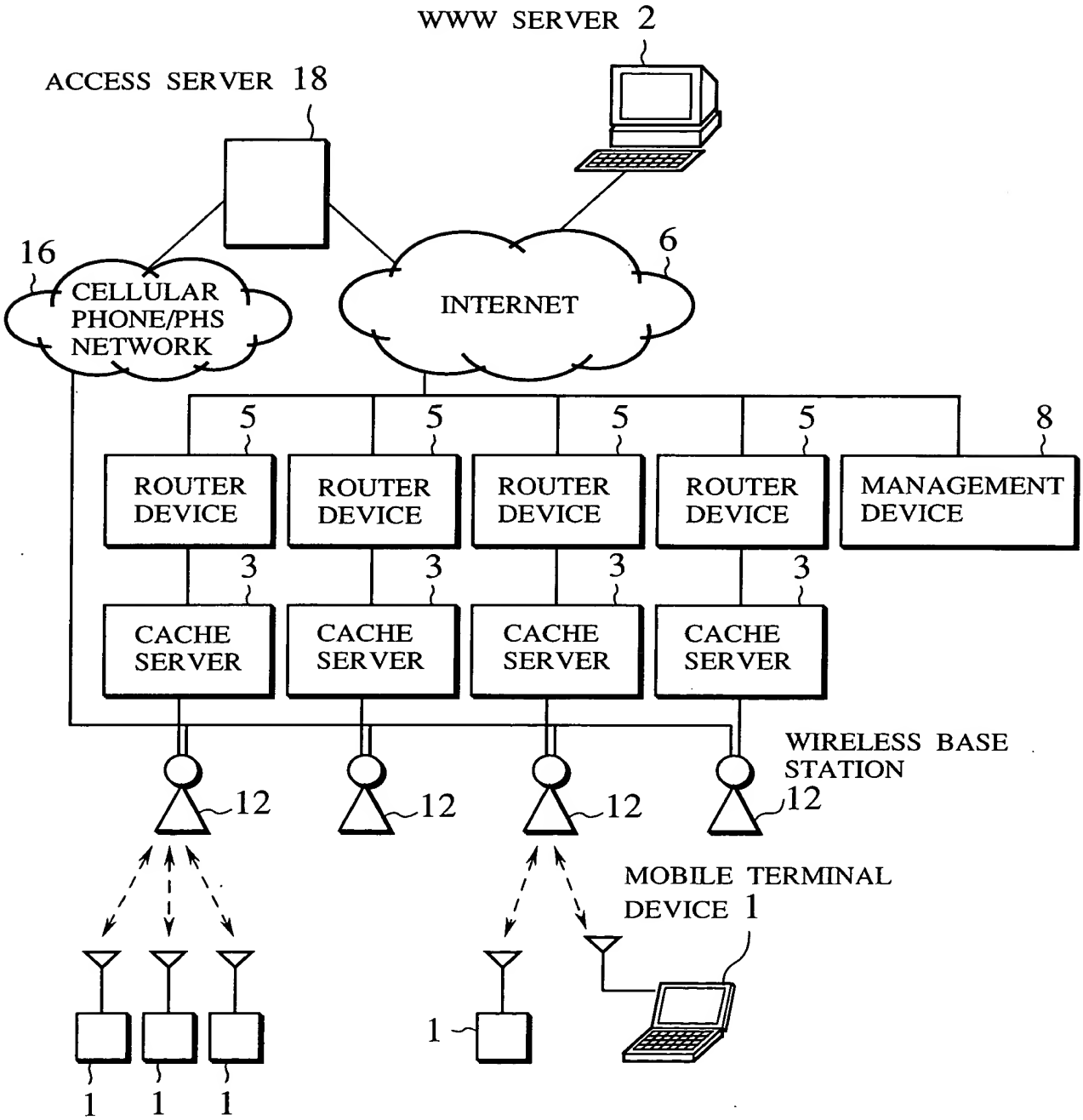

WWW SERVER 2
ACCESS SERVER 18
16
CELLULAR PHONE/PHS NETWORK
6
INTERNET
5
5
5
5
8
ROUTER DEVICE
ROUTER DEVICE
ROUTER DEVICE
ROUTER DEVICE
MANAGEMENT DEVICE
3
3
3
3
CACHE SERVER
CACHE SERVER
CACHE SERVER
CACHE SERVER
WIRELESS BASE STATION
12
12
12
12
MOBILE TERMINAL DEVICE 1
1
1
1
1

FIG.2

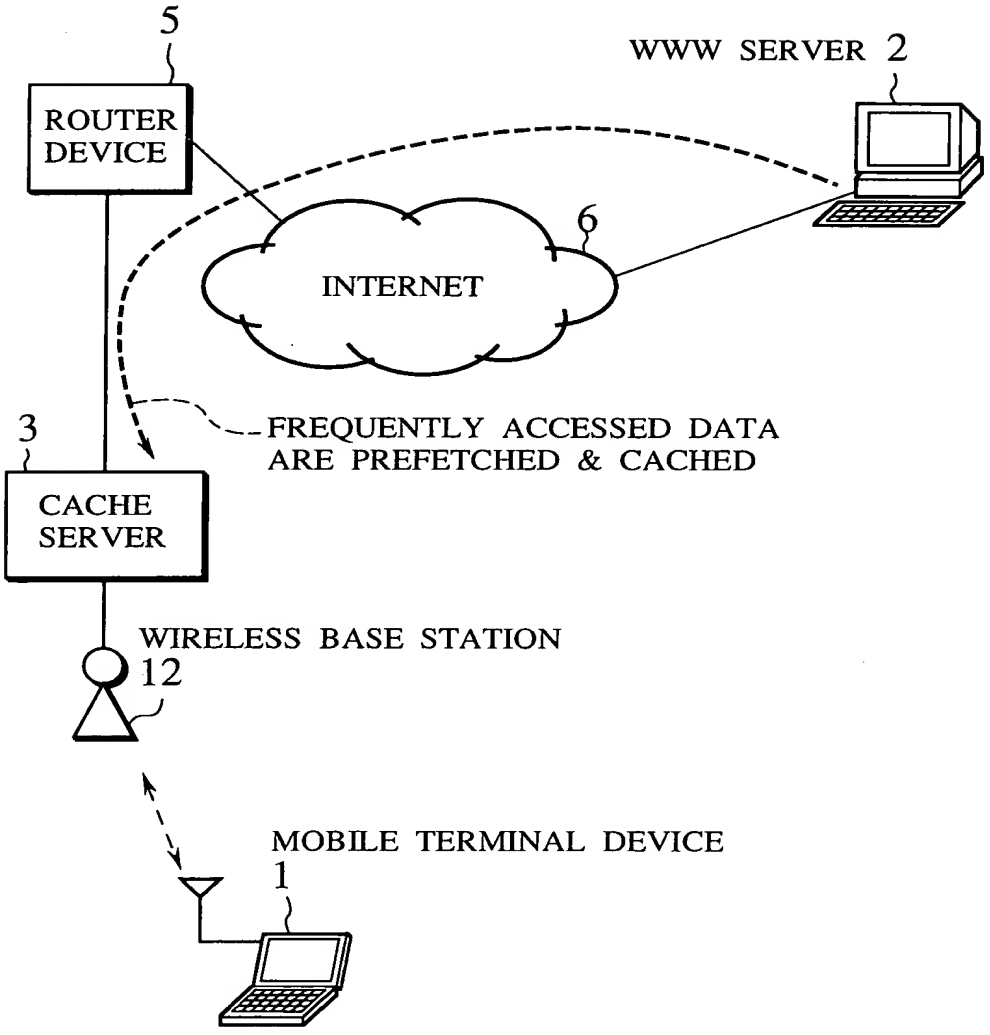

5
ROUTER DEVICE
WWW SERVER 2
6
INTERNET
FREQUENTLY ACCESSED DATA ARE PREFETCHED & CACHED
3
CACHE SERVER
WIRELESS BASE STATION
12
MOBILE TERMINAL DEVICE
1

FIG.3

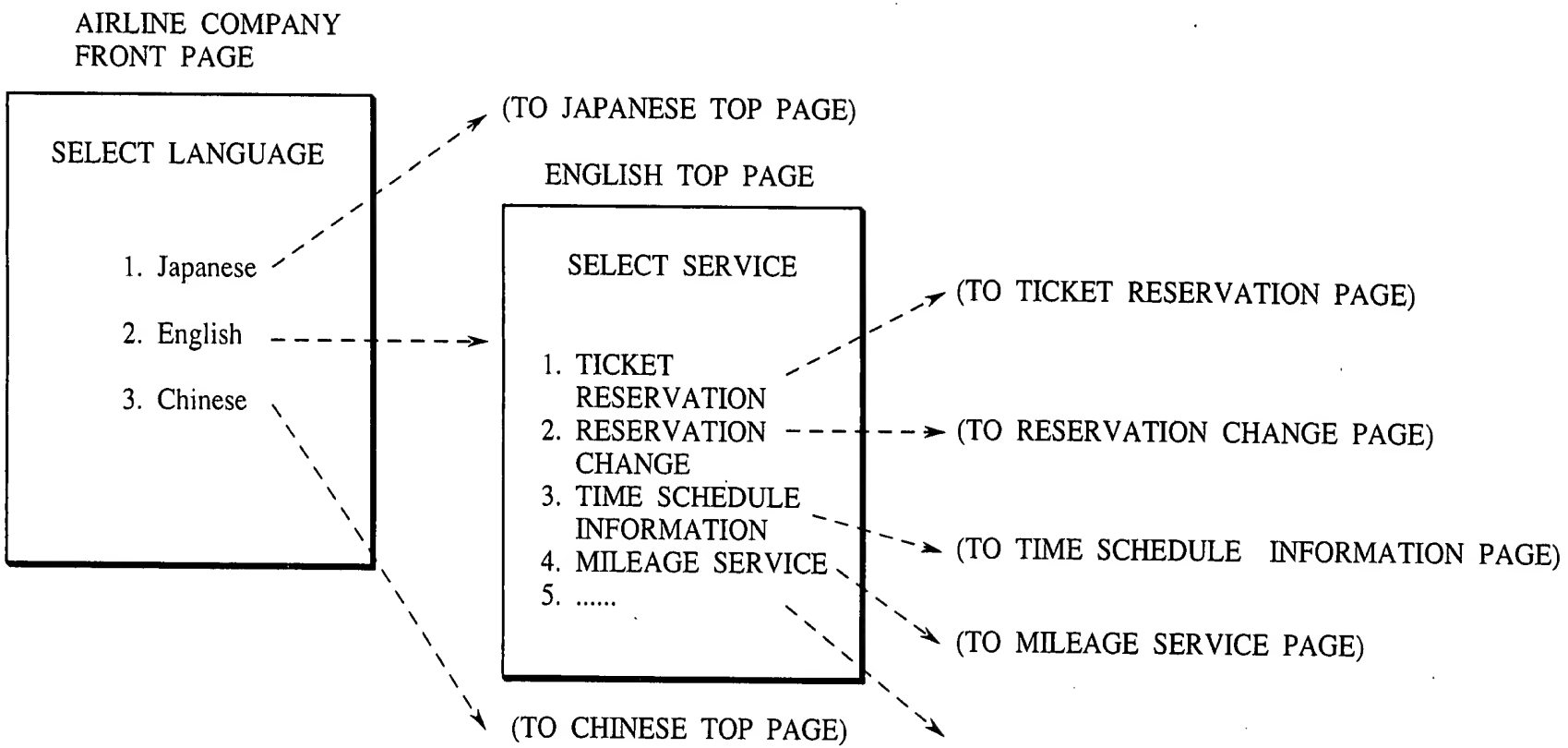

AIRLINE COMPANY
FRONT PAGE
SELECT LANGUAGE
1. Japanese
2. English
3. Chinese
(TO JAPANESE TOP PAGE)
ENGLISH TOP PAGE
SELECT SERVICE
1. TICKET RESERVATION
2. RESERVATION CHANGE
3. TIME SCHEDULE INFORMATION
4. MILEAGE SERVICE
5. .....
(TO TICKET RESERVATION PAGE)
(TO RESERVATION CHANGE PAGE)
(TO TIME SCHEDULE INFORMATION PAGE)
(TO MILEAGE SERVICE PAGE)
(TO CHINESE TOP PAGE)

FIG.4

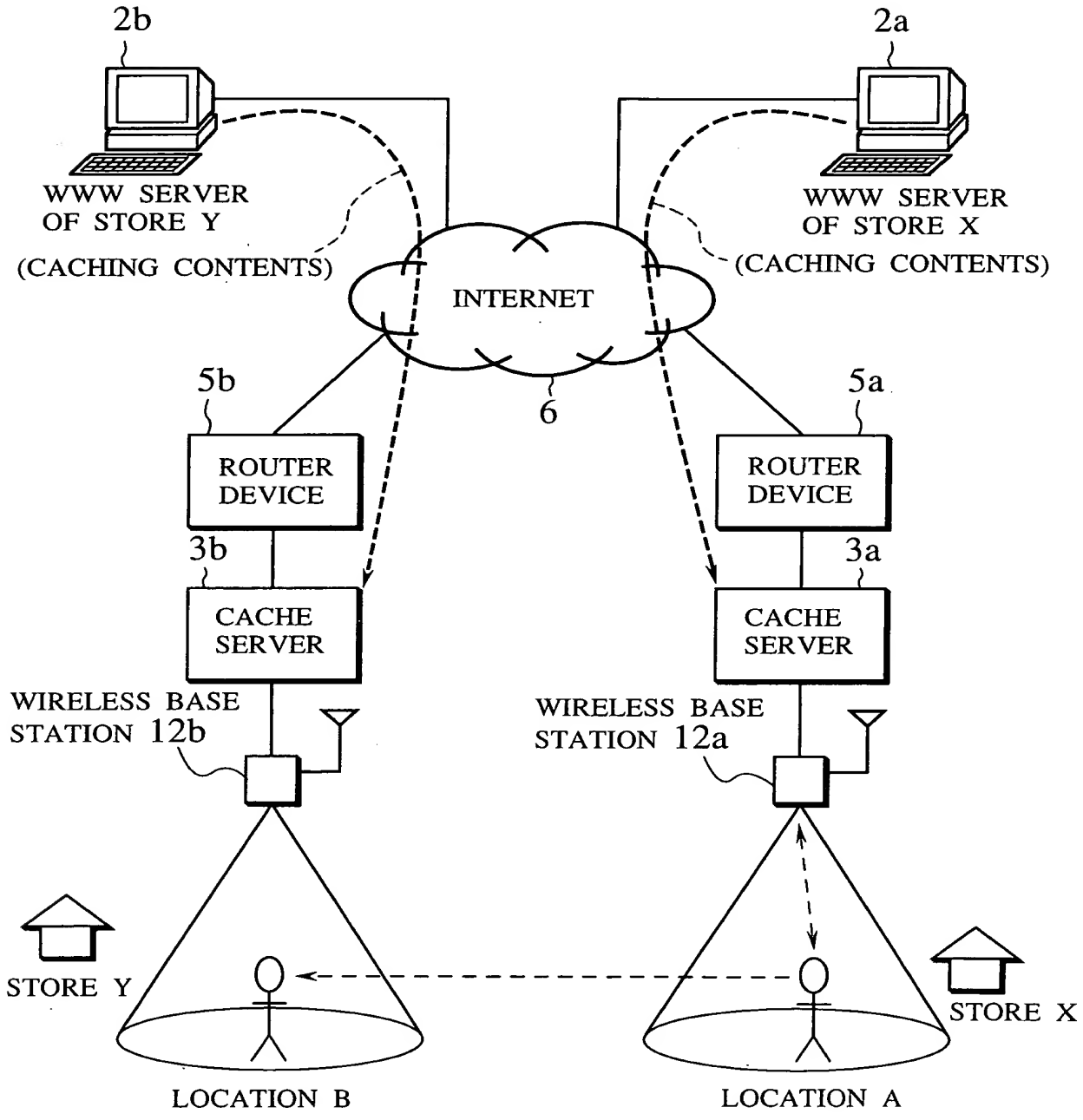

2b
2a
WWW SERVER
OF STORE Y
(CACHING CONTENTS)
WWW SERVER
OF STORE X
(CACHING CONTENTS)
INTERNET
6
5b
5a
ROUTER
DEVICE
ROUTER
DEVICE
3b
3a
CACHE
SERVER
CACHE
SERVER
WIRELESS BASE
STATION 12b
WIRELESS BASE
STATION 12a
STORE Y
STORE X
LOCATION B
LOCATION A

FIG.5

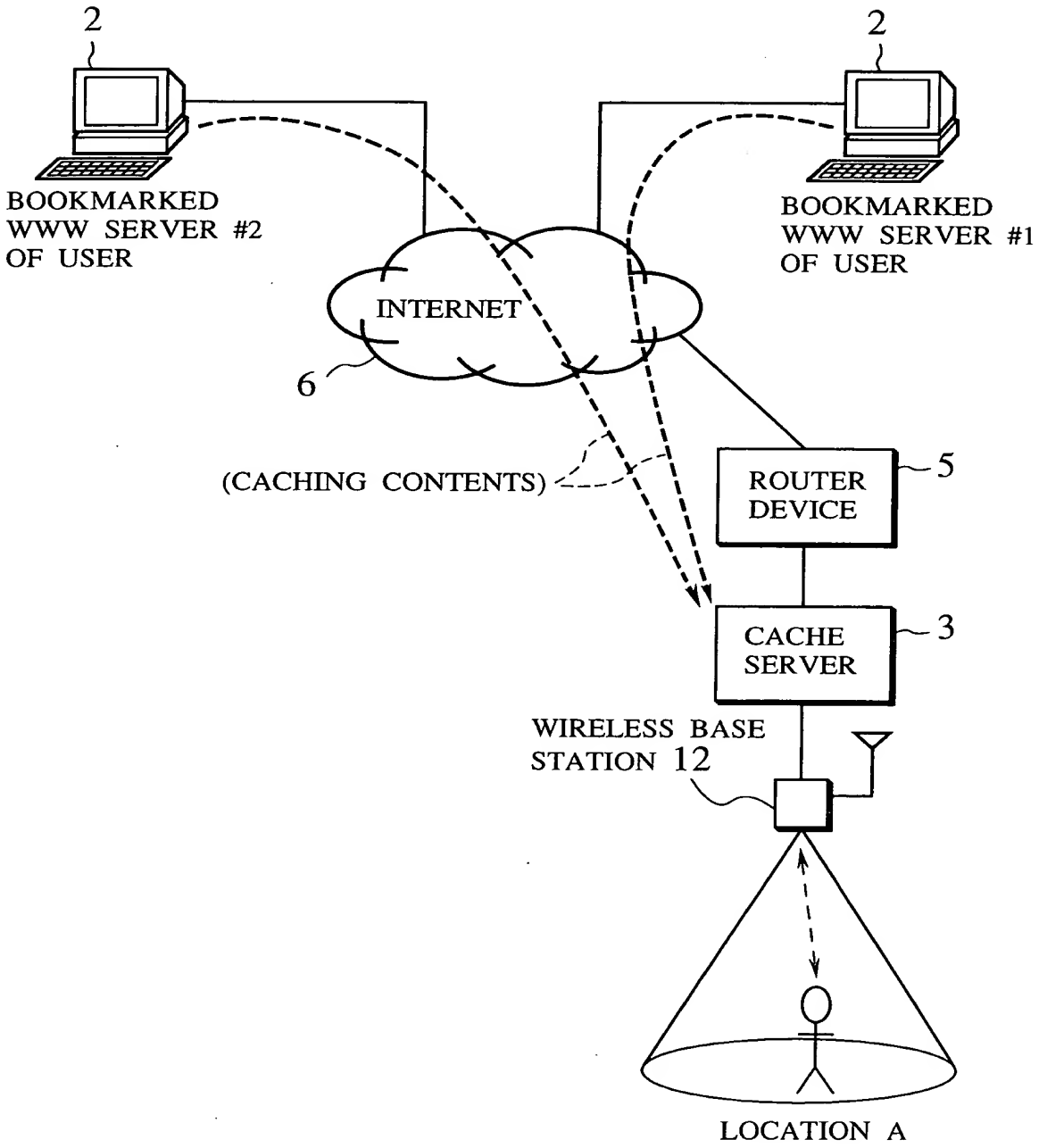

2
2
BOOKMARKED
WWW SERVER #2
OF USER
BOOKMARKED
WWW SERVER #1
OF USER
INTERNET
6
(CACHING CONTENTS)
ROUTER
DEVICE
5
CACHE
SERVER
3
WIRELESS BASE
STATION 12
LOCATION A

FIG.6

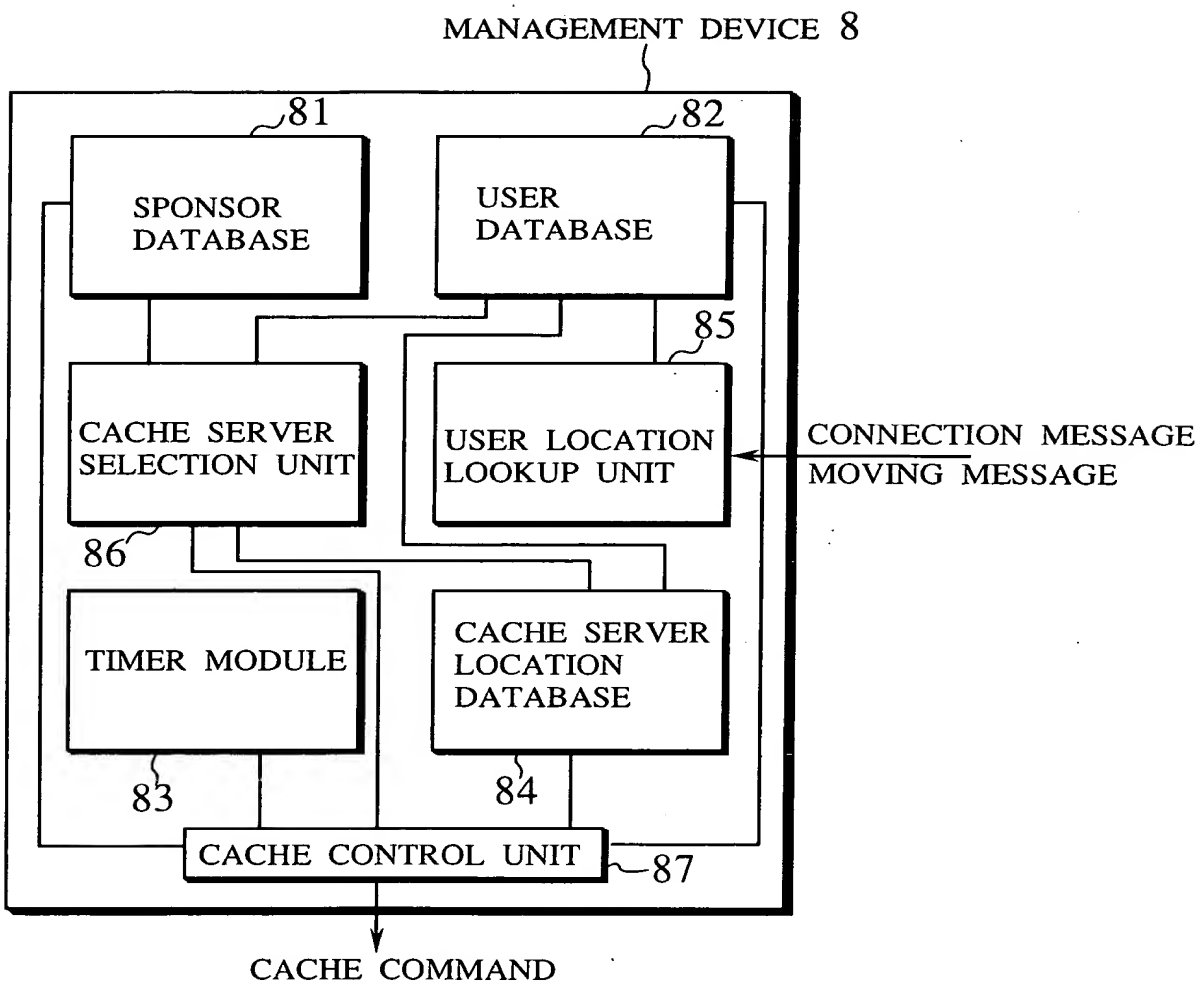

MANAGEMENT DEVICE 8
81
82
SPONSOR DATABASE
USER DATABASE
85
CACHE SERVER SELECTION UNIT
USER LOCATION LOOKUP UNIT
CONNECTION MESSAGE
MOVING MESSAGE
86
TIMER MODULE
CACHE SERVER LOCATION DATABASE
83
84
CACHE CONTROL UNIT
87
CACHE COMMAND

FIG.7A

SPONSOR ID	CACHING RANGE	CACHE DATA AMOUNT	CACHE UPDATE FREQUENCY

PREMIER SPONSOR DATABASE FORMAT

FIG.7B

SPONSOR ID	CACHING RANGE	CACHE DATA AMOUNT	CACHE UPDATE FREQUENCY
URL1	SERVER A, B, C	PAGE A1.....A10	6 HOURS
URL2	SERVER D, E, F	PAGE B1.....B5	24 HOURS
URL3	SERVER G	PAGE C1.....C5	24 HOURS
URL4	SERVER H	PAGE D1	72 HOURS

EXEMPLARY PREMIER SPONSOR DATABASE

FIG.8

USER ID	CACHING ORDER	CONNECTED CELL ID	NEARBY CACHE SERVER ID

PREMIER USER DATABASE FORMAT

FIG.9

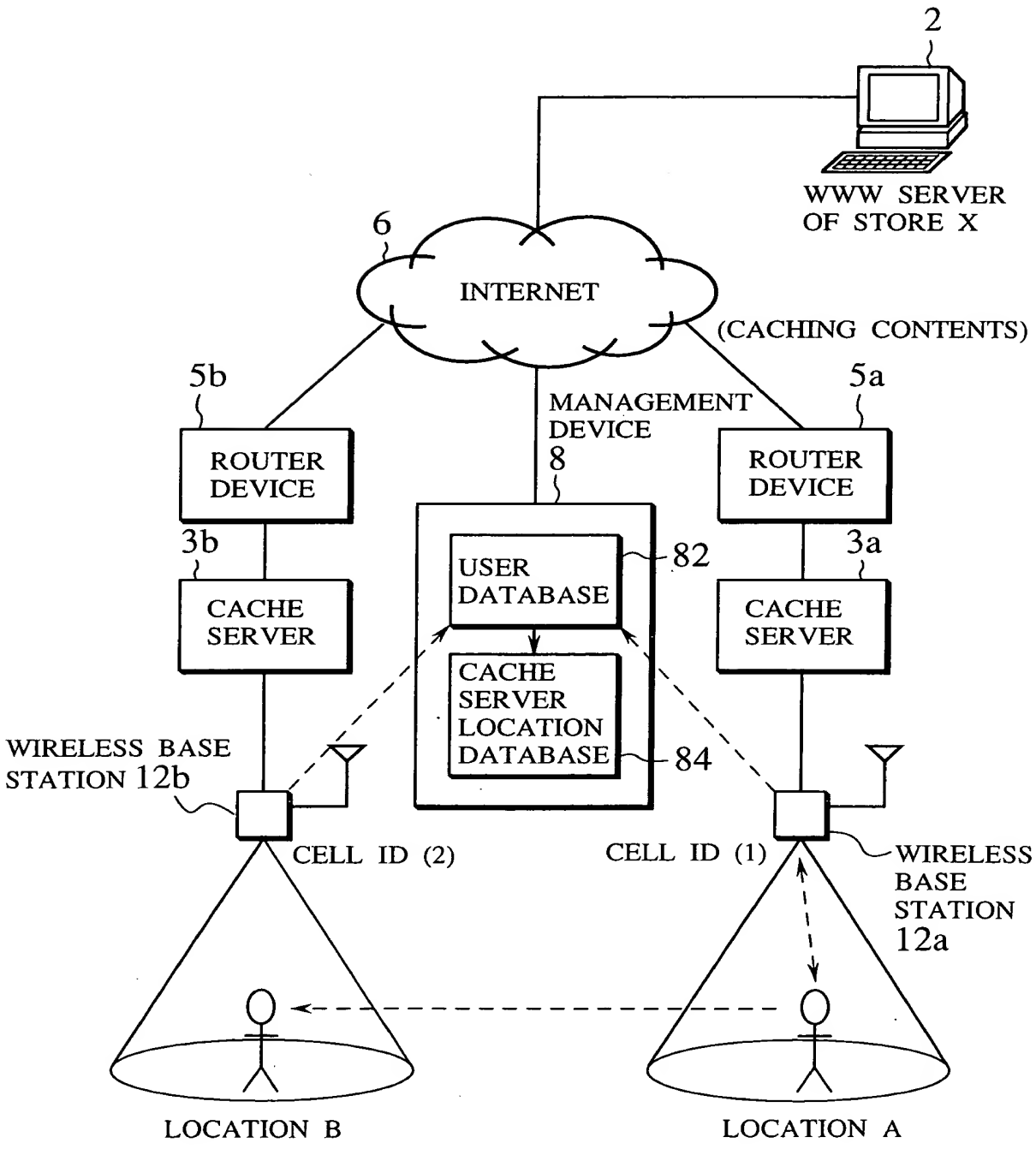

2
WWW SERVER
OF STORE X
6
INTERNET
(CACHING CONTENTS)
5b
5a
MANAGEMENT
DEVICE
8
ROUTER
DEVICE
ROUTER
DEVICE
3b
3a
USER
DATABASE
82
CACHE
SERVER
CACHE
SERVER
CACHE
SERVER
LOCATION
DATABASE
84
WIRELESS BASE
STATION 12b
CELL ID (2)
CELL ID (1)
WIRELESS
BASE
STATION
12a
LOCATION B
LOCATION A

FIG.10

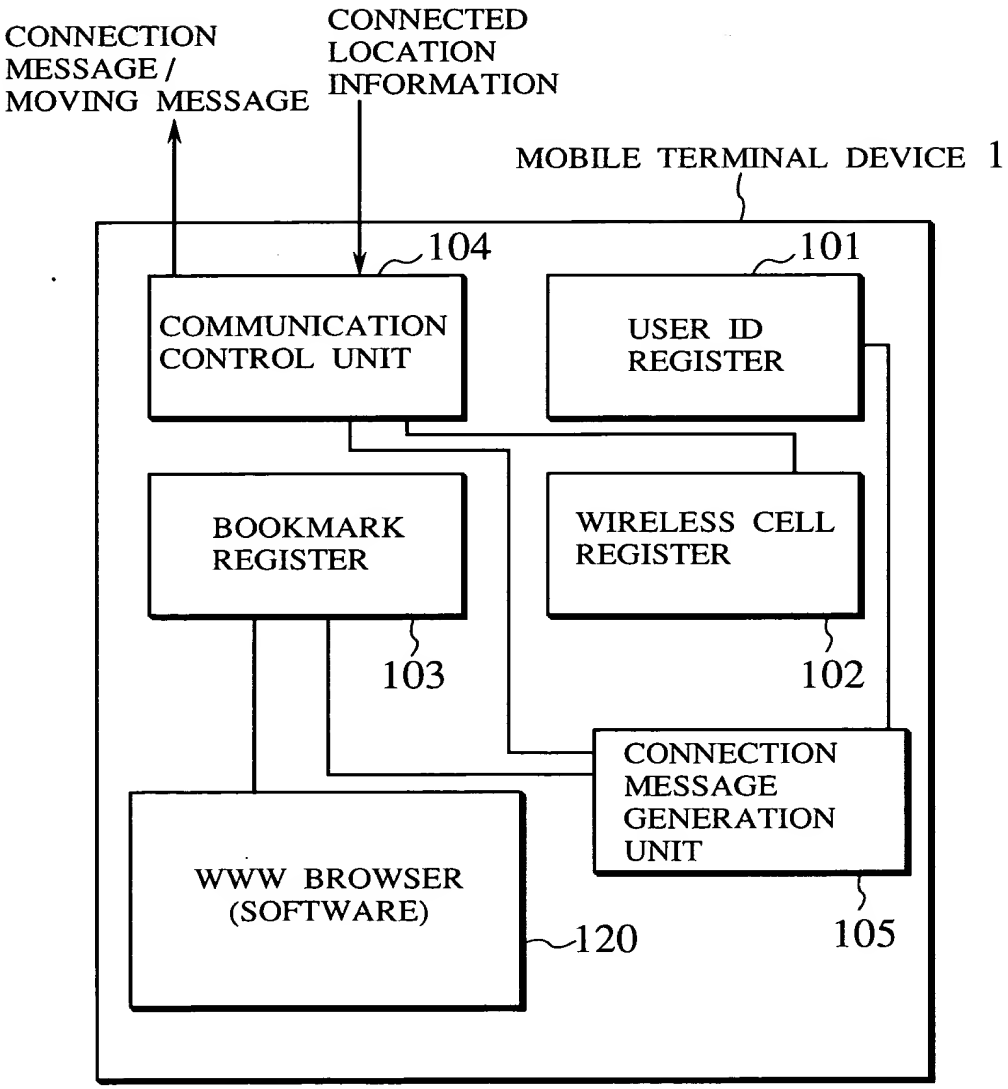

CONNECTION MESSAGE / MOVING MESSAGE
CONNECTED LOCATION INFORMATION
MOBILE TERMINAL DEVICE 1
104
101
COMMUNICATION CONTROL UNIT
USER ID REGISTER
BOOKMARK REGISTER
WIRELESS CELL REGISTER
103
102
CONNECTION MESSAGE GENERATION UNIT
WWW BROWSER (SOFTWARE)
120
105

FIG.11

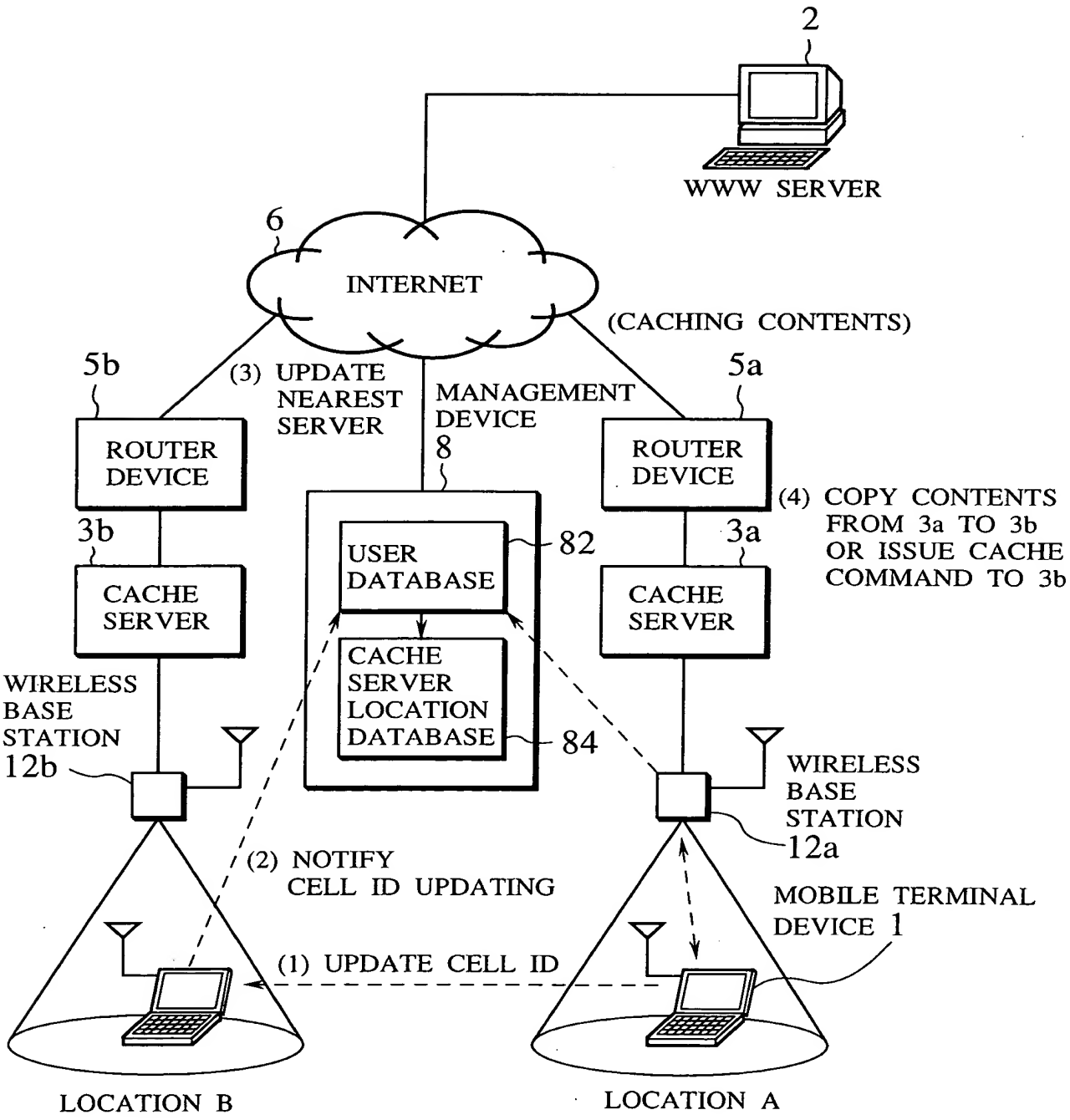

2
WWW SERVER
6
INTERNET
(CACHING CONTENTS)
5b
(3) UPDATE NEAREST SERVER
MANAGEMENT DEVICE
8
5a
ROUTER DEVICE
ROUTER DEVICE
(4) COPY CONTENTS FROM 3a TO 3b OR ISSUE CACHE COMMAND TO 3b
3b
3a
USER DATABASE
82
CACHE SERVER
CACHE SERVER
CACHE SERVER LOCATION DATABASE
84
WIRELESS BASE STATION 12b
WIRELESS BASE STATION 12a
(2) NOTIFY CELL ID UPDATING
MOBILE TERMINAL DEVICE 1
(1) UPDATE CELL ID
LOCATION B
LOCATION A

FIG.12

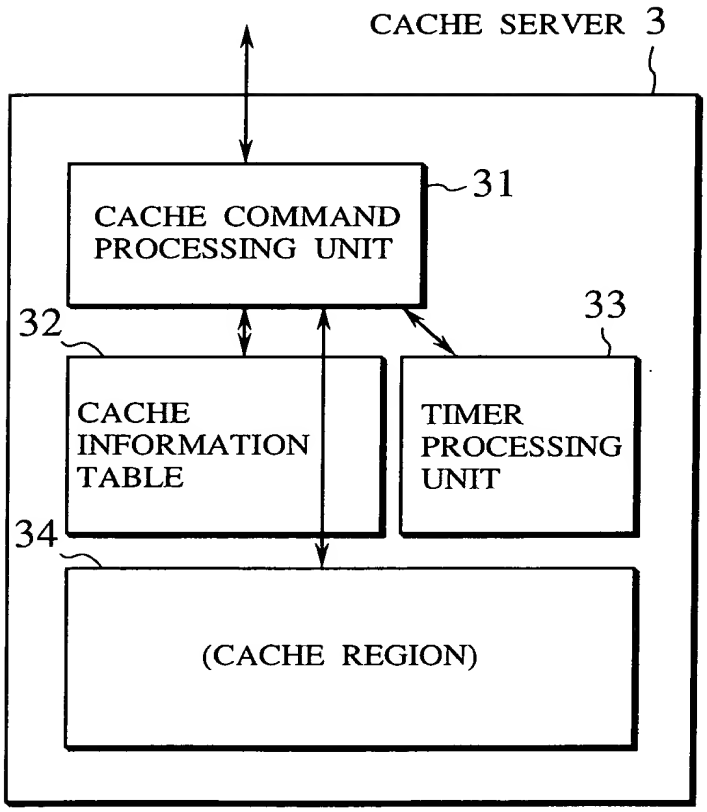

CACHE SERVER 3
CACHE COMMAND PROCESSING UNIT
31
32
33
CACHE INFORMATION TABLE
TIMER PROCESSING UNIT
34
(CACHE REGION)

FIG.13

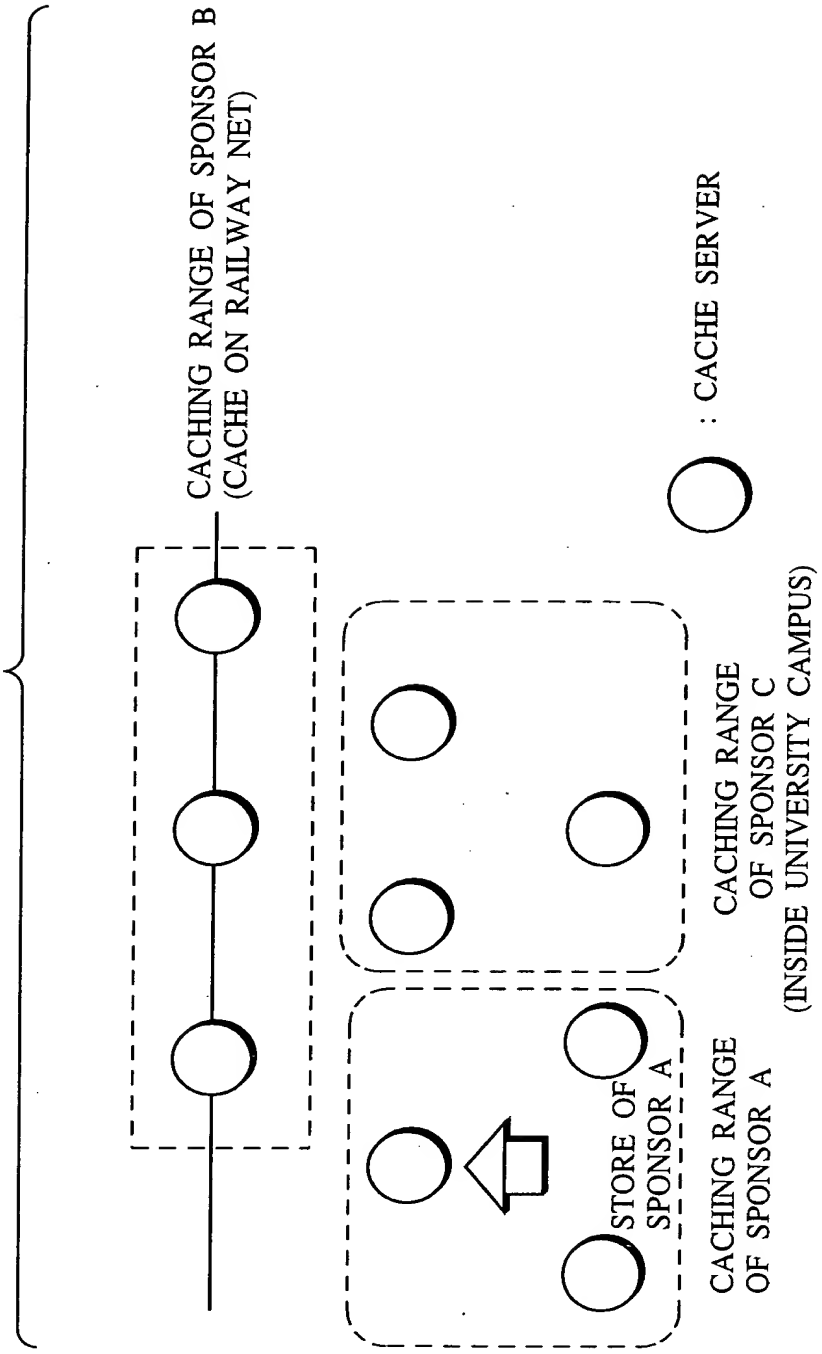

CACHING RANGE OF SPONSOR B
(CACHE ON RAILWAY NET)
: CACHE SERVER
STORE OF
SPONSOR A
CACHING RANGE
OF SPONSOR A
CACHING RANGE
OF SPONSOR C
(INSIDE UNIVERSITY CAMPUS)

FIG.14

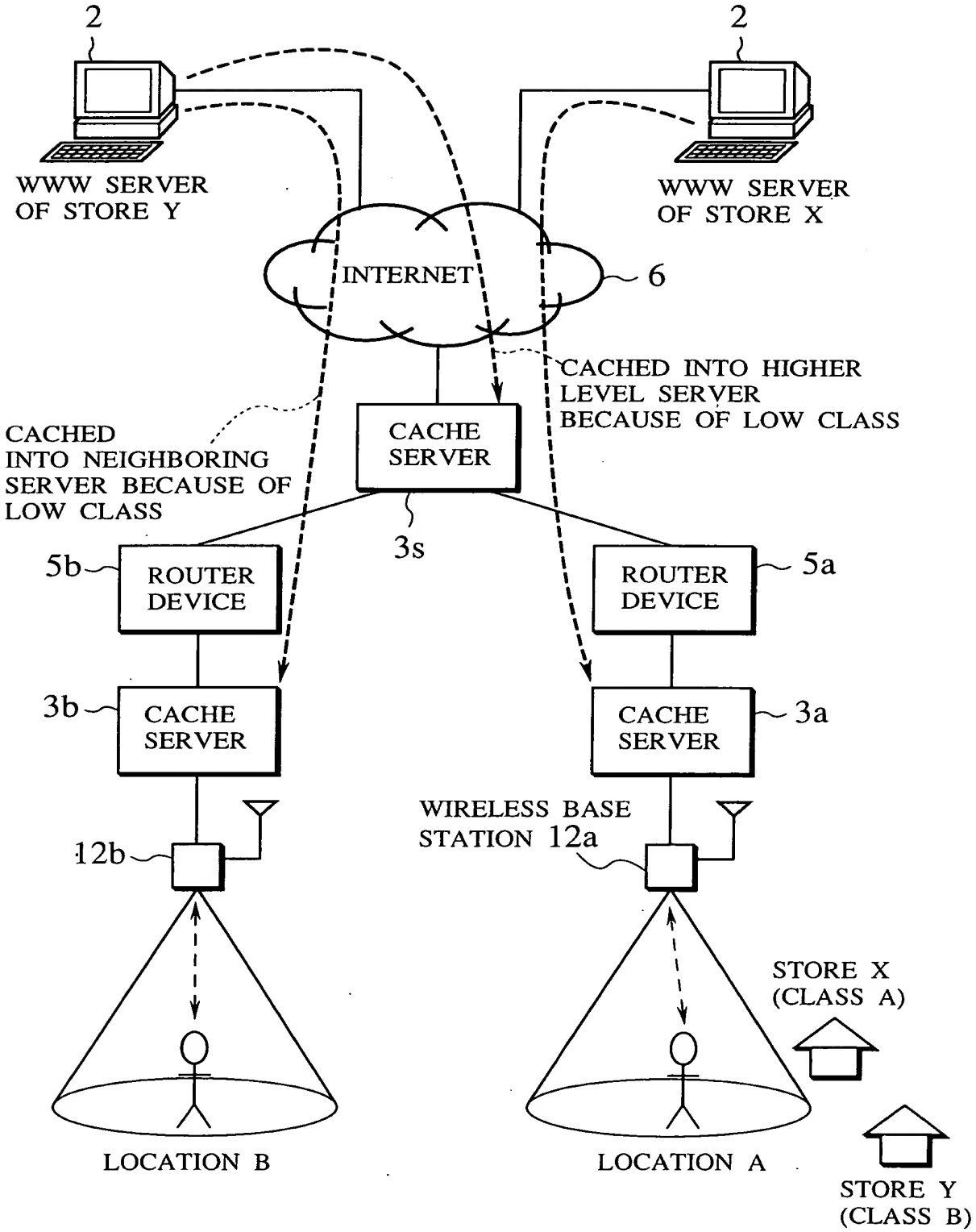

2
2
WWW SERVER OF STORE Y
WWW SERVER OF STORE X
INTERNET
6
CACHED INTO HIGHER LEVEL SERVER BECAUSE OF LOW CLASS
CACHED INTO NEIGHBORING SERVER BECAUSE OF LOW CLASS
CACHE SERVER
3s
5b
ROUTER DEVICE
ROUTER DEVICE
5a
3b
CACHE SERVER
CACHE SERVER
3a
WIRELESS BASE STATION 12a
12b
STORE X (CLASS A)
LOCATION B
LOCATION A
STORE Y (CLASS B)

FIG.15

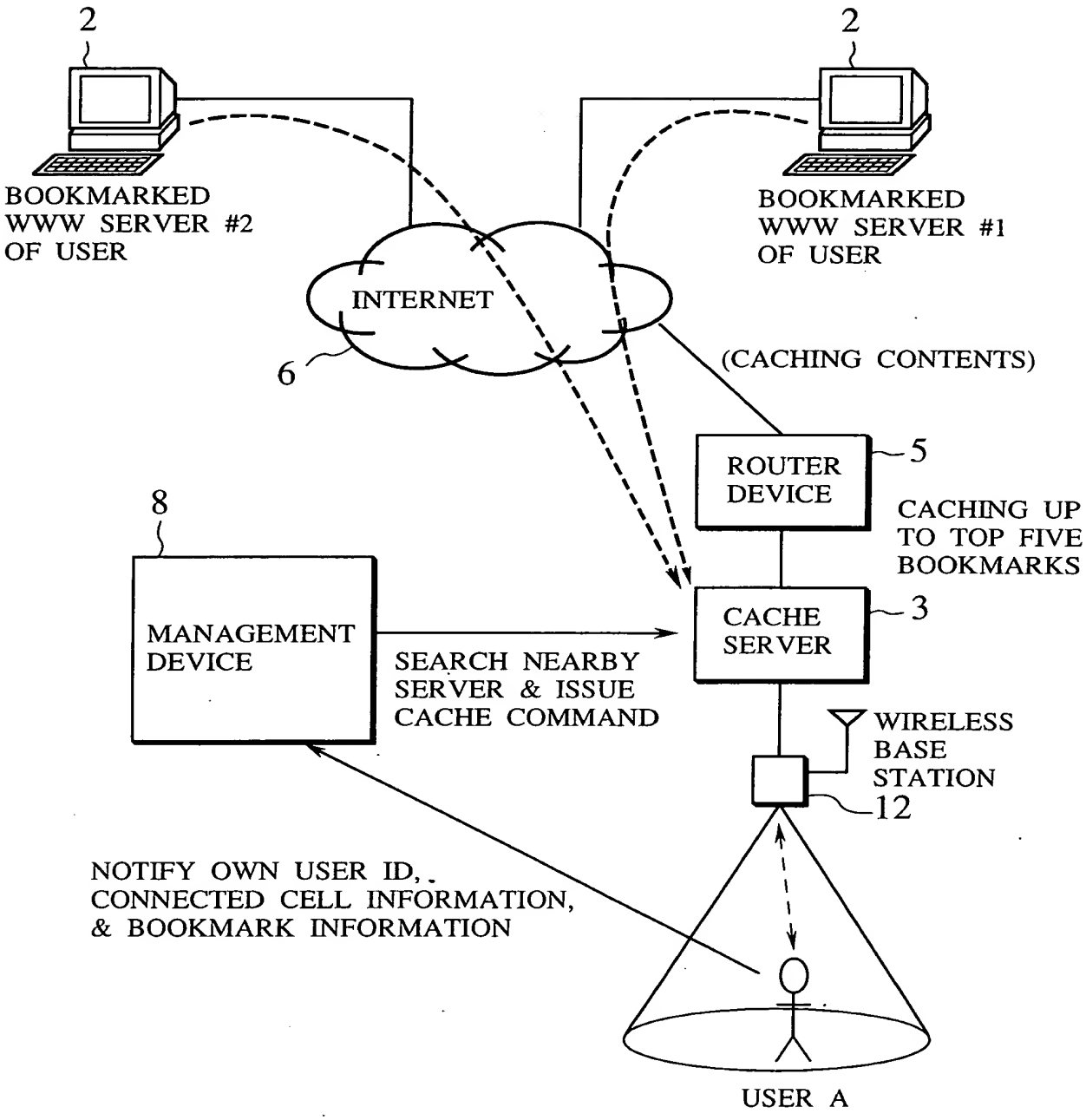

2
2
BOOKMARKED WWW SERVER #2 OF USER
BOOKMARKED WWW SERVER #1 OF USER
INTERNET
6
(CACHING CONTENTS)
ROUTER DEVICE
5
CACHING UP TO TOP FIVE BOOKMARKS
8
MANAGEMENT DEVICE
SEARCH NEARBY SERVER & ISSUE CACHE COMMAND
CACHE SERVER
3
WIRELESS BASE STATION
12
NOTIFY OWN USER ID, CONNECTED CELL INFORMATION, & BOOKMARK INFORMATION
USER A

FIG.16

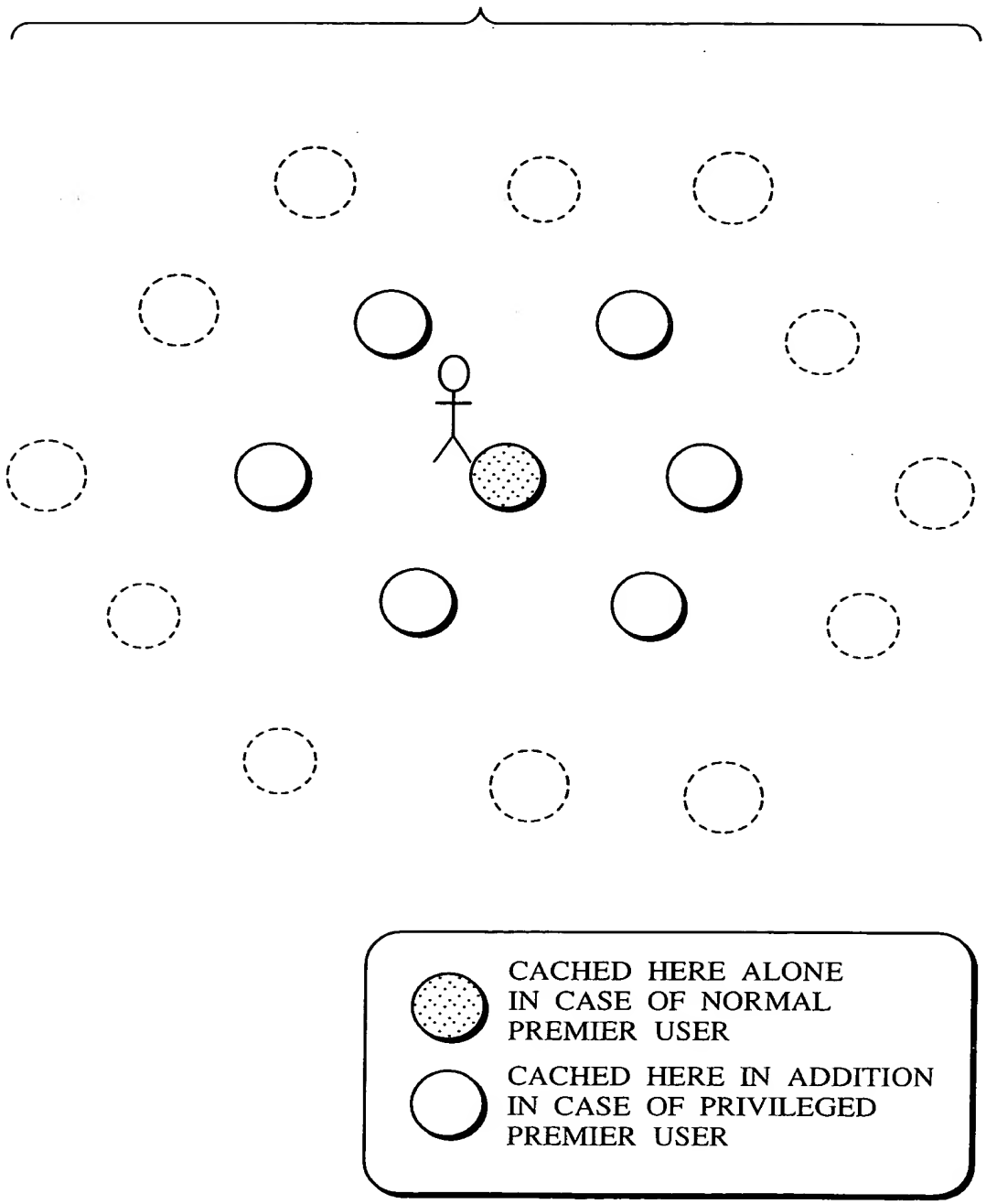

CACHED HERE ALONE IN CASE OF NORMAL PREMIER USER
CACHED HERE IN ADDITION IN CASE OF PRIVILEGED PREMIER USER

FIG.17

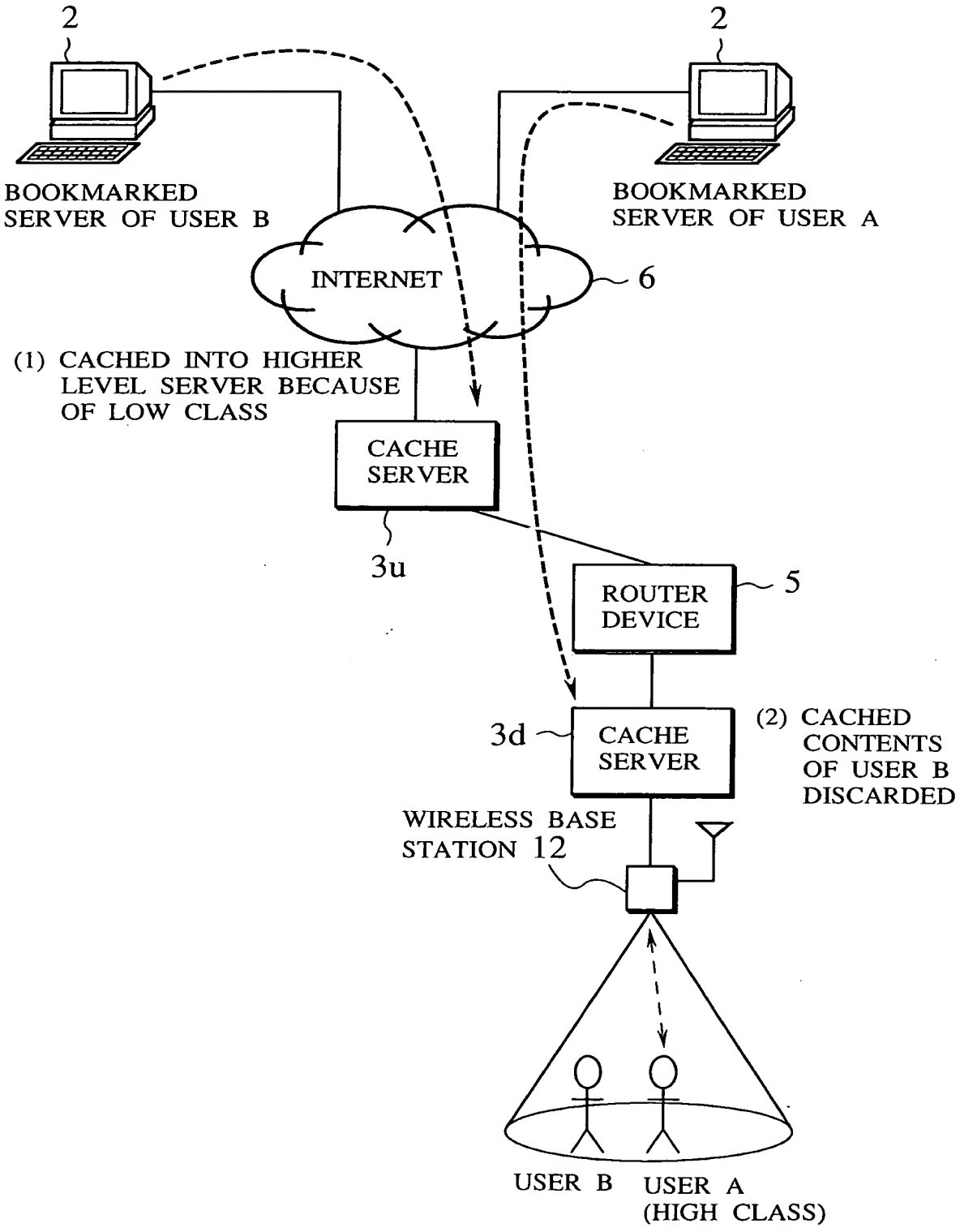

2
2
BOOKMARKED SERVER OF USER B
BOOKMARKED SERVER OF USER A
INTERNET
6
(1) CACHED INTO HIGHER LEVEL SERVER BECAUSE OF LOW CLASS
CACHE SERVER
3u
ROUTER DEVICE
5
3d
CACHE SERVER
(2) CACHED CONTENTS OF USER B DISCARDED
WIRELESS BASE STATION 12
USER B
USER A (HIGH CLASS)

FIG.18

USER ID	CACHING ORDER	CONNECTED CELL ID	NEARBY CACHE SERVER ID	HIGH PRIORITY PAGE

FIG.19

USER ID	CACHING ORDER	CONNECTED CELL ID	NEARBY CACHE SERVER ID	RELATED SPONSOR INFORMATION

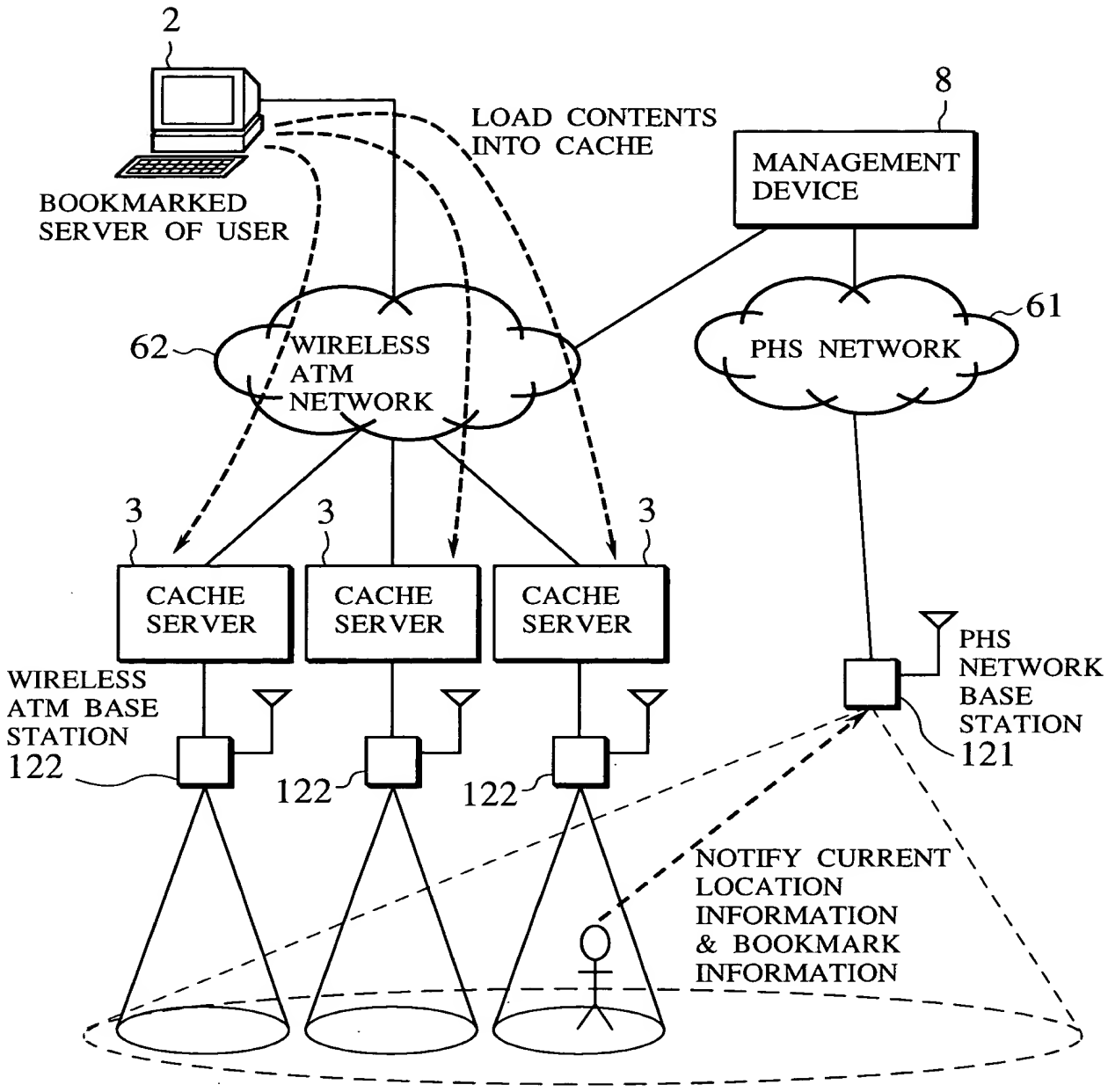
FIG.20

SPONSOR ID	CACHING RANGE	CACHE DATA AMOUNT	CACHE UPDATE FREQUENCY	PUSH DATA

FIG.21

SPONSOR ID	CACHING RANGE	CACHE DATA AMOUNT	CACHE UPDATE FREQUENCY	SPECIFIED USER ID

FIG.22


2
BOOKMARKED SERVER OF USER
LOAD CONTENTS INTO CACHE
8
MANAGEMENT DEVICE
62
WIRELESS ATM NETWORK
61
PHS NETWORK
3
3
3
CACHE SERVER
CACHE SERVER
CACHE SERVER
WIRELESS ATM BASE STATION
122
122
122
PHS NETWORK BASE STATION
121
NOTIFY CURRENT LOCATION INFORMATION & BOOKMARK INFORMATION